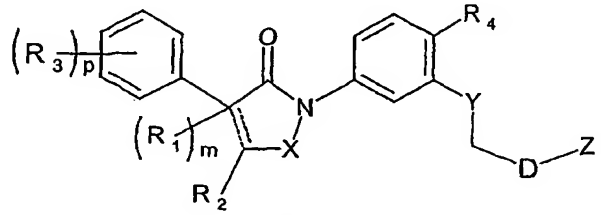
Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein:

R_1 is hydrogen, hydroxy, fluoro, chloro, C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkyloxy, C_{1-6}alkoxy or haloC_{1-6}alkoxy;

m is 0 when ====== is a double bond and m is 1 when ====== is a single bond;

R_2 is hydrogen, halogen, cyano, nitro, C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkyloxy, haloC_{1-6}alkyl, C_{1-6}alkoxy, haloC_{1-6}alkoxy, C_{1-6}alkylthio, amino, mono- or di-C_{1-6}alkylamino or an N-linked 4 to 7 membered heterocyclic group;

X is $-(CH_2-CH_2)-$, $-(CH=CH)-$, $-(CH_2)_3-$, $-C(CH_3)_2-$, $-(CH=CH-CH_2)-$, $-(CH_2-CH=CH)-$ or a group $-(CHR_5)-$ wherein R_5 is hydrogen, halogen, hydroxy, cyano, nitro, C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkyloxy, haloC_{1-6}alkyl, C_{1-6}alkoxy, haloC_{1-6}alkoxy or C_{1-6}alkylthio;

R_3 is halogen, cyano, C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkyloxy, C_{1-6}alkoxy, C_{1-6}alkylthio, hydroxy, amino, mono- or di-C_{1-6}alkylamino, an N-linked 4 to 7 membered heterocyclic group, nitro, haloC_{1-6}alkyl, haloC_{1-6}alkoxy, aryl, arylC_{1-6}alkyl, arylC_{1-6}alkyloxy, arylC_{1-6}alkylthio or $COOR_6$, $CONR_7R_8$ or COR_9 wherein R_6, R_7, R_8 and R_9 are independently hydrogen or C_{1-6}alkyl;

p is 0, 1 or 2 or 3;

R_4 is hydrogen, halogen, hydroxy, cyano, nitro, C_{1-6}alkyl, C_{1-6}alkanoyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkyloxy, haloC_{1-6}alkyl, C_{1-6}alkoxy, haloC_{1-6}alkoxy, C_{1-6}alkylthio, amino, mono- or di-C_{1-6}alkylamino or an N-linked 4 to 7 membered heterocyclic group;

Y is oxygen, sulfur, $-CH_2-$ or NR_{10} wherein R_{10} is hydrogen or C_{1-6}alkyl;

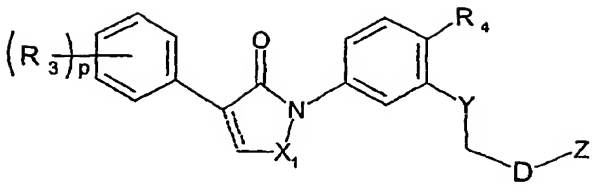
D is a single bond, $-CH_2-$, $-(CH_2)_2-$ or $-CH=CH-$; and

Z is an optionally substituted C-linked 4 to 7 membered heterocyclic group containing at least one nitrogen, an optionally substituted N-linked 4 to 7 membered heterocyclic group, or Z is $-NR_{11}R_{12}$ where R_{11} and R_{12} are independently hydrogen or C_{1-6}alkyl.

2. A compound as claimed in claim 1, wherein X is $-CH_2-$.

3. A compound as claimed in claim 1 or claim 2, wherein when ====== is a single bond, R_1 is hydrogen, hydroxy or C_{1-6}alkoxy.

4. A compound as claimed in claim 1 having the following formula (Ia):



(Ia)

wherein R_3, p, R_4, Y, D, Z, ====== are as defined in claim 1 and X_1 is $-CH_2-$ or -HC(OH)-.

5. A compound as claimed in any of claims 1-4, wherein p is 1 or 2 and R_3 is/are halogen, particularly chloro or fluoro, attached at the 3 or the 3,4-positions of the phenyl ring.

6. A compound as claimed in any of claims 1-5, wherein R_4 is C_{1-6}alkoxy (particularly methoxy), OCF_3, halogen or cyano.

7. A compound as claimed in any of claims 1-6, wherein D is $-CH_2-$.

8. A compound as claimed in any of claims 1-7, wherein Y is oxygen.

9. A compound as claimed in any of claims 1-8, wherein Z is an optionally substituted N-linked 4 to 7 membered heterocyclic group.

10. A compound as claimed in claim 9, wherein Z is piperidyl.

11. A compound as claimed in claim 1 which is:

3-(3,4-Dichloro-phenyl)-3-hydroxy-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-pyrrolidin-2-one
3-(3,4-Dichloro-phenyl)-3-hydroxy-1-[4-methoxy-3-(2-morpholin-4-yl-ethoxy)-phenyl]-pyrrolidin-2-one
3-(3,4-Dichloro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-pyrrolidin-2-one
1-[4-Chloro-3-(2-piperidin-1-yl-ethoxy)-phenyl]-3-(3,4-dichloro-phenyl)-pyrrolidin-2-one
1-[4-Chloro-3-(2-piperidin-1-yl-ethoxy)-phenyl]-3-(3,4-dichloro-phenyl)-3-hydroxy-pyrrolidin-2-one
3-(3,4-Dichloro-phenyl)-1-(4-methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl)-pyrrolidin-2-one
3-(3,4-Dichloro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-1,5-dihydro-pyrrol-2-one
3-(3,4-Dichloro-phenyl)-1-[4-methoxy-3-(2-morpholin-4-yl-ethoxy)-phenyl]-1,5-dihydro-pyrrol-2-one
1-[4-Chloro-3-(2-piperidin-1-yl-ethoxy)-phenyl]-3-(3,4-dichloro-phenyl)-1,5-dihydro-pyrrol-2-one

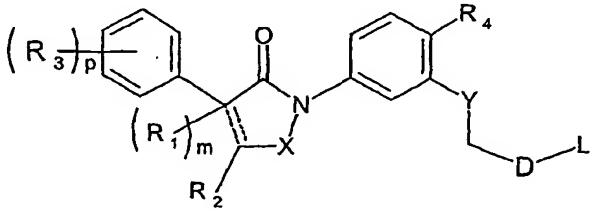
3-(3,4-Dichloro-phenyl)-1-[4-methoxy-3-(2-pyrrolidin-1-yl-ethoxy)-phenyl]-1,5-dihydro-pyrrol-2-one
3-(3-Fluoro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-1,5-dihydro-pyrrol-2-one
3-(3,4-Dichloro-phenyl)-1-(-3-[2-(4,4-difluoro-piperidin-1-yl)-ethoxy]-4-methoxy-phenyl)-1,5-dihydro-pyrrol-2-one
3-(3-Fluoro-phenyl)-5-hydroxy-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-pyrrolidin-2-one
1-[4-Chloro-3-(2-piperidin-1-yl-ethoxy)-phenyl]-3-(3,4-dichloro-phenyl)-5-hydroxy-pyrrolidin-2-one
3-(3,4-Dichloro-phenyl)-1-(-3-[2-(4,4-difluoro-piperidin-1-yl)-ethoxy]-4-methoxy-phenyl)-5-hydroxy-pyrrolidin-2-one
3-(3-Fluoro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-pyrrolidin-2-one
3-(3,4-Dichloro-phenyl)-1-[4-methoxy-3-(2-pyrrolidin-1-yl-ethoxy)-phenyl]-pyrrolidin-2-one
3-(3,4-Dichloro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-3-methyl-pyrrolidin-2-one hydrochloride salt
3-(3-Chloro-phenyl)-1-{4-methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl}-1,5-dihydro-pyrrol-2-one hydrochloride salt
3-(3,4-Dichloro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-3,4-dihydro-1H-pyridin-2-one
3-(3,4-Dichloro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-piperidin-2-one
3-(3,4-Dichloro-phenyl)-1-(4-methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl)-3,4-dihydro-pyrrol-2-one
3-(3,4-Dichloro-phenyl)-1-(4-methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl)-4-methyl-1,5-dihydro-pyrrol-2-one
3-(4-Chloro-phenyl)-1-(4-methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl)-3,4-dihydro-pyrrol-2-one
3-(4-Chloro-phenyl)-1-(4-methoxy-3-[2-piperidin-1-yl)-ethoxy]-phenyl)-3,4-dihydro-pyrrol-2-one
3-(3,4-Dichloro-phenyl)-1-[4-methoxy-3-(piperidin-3-ylmethoxy)-phenyl]-pyrrolidin-one
3-(3,4-Dichloro-phenyl)-1-[4-methoxy-3-(1-methyl-piperidin-3-ylmethoxy)-phenyl]-pyrrolidin-one
N-{4-[3-(3,4-dichlorophenyl)-2-oxo-2,5-dihydro-1*H*-pyrrol-1-yl]-2-[2-(1-piperidinyl)ethoxy]phenyl}acetamide
N-{4-[3-(3,4-dichlorophenyl)-2-oxo-pyrrolidin-1-yl]-2-[2-(1-piperidinyl)ethoxy]phenyl}acetamide
3-(3,4-Dichloro-phenyl)-1-{4-methoxy-3-[2-(4-methyl)-piperidin-1-yl-ethoxy]-phenyl}-3-methyl-pyrrolidin-2-one
3-(3-Chloro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-pyrrolidin-2-one
3-(3-Trifluoromethyl-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-pyrrolidin-2-one
3-(3-Trifluoromethyl-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-1,5-dihydro-pyrrol-2-one
3-(3-Chloro-phenyl)-5-methoxy-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-pyrrolidin-2-one
3-(3-Chloro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-1,5-dihydro-pyrrol-2-one

3-(4-Fluoro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-1,5-dihydro-pyrrol-2-one
3-(4-Fluoro-phenyl)-1-[4-methoxy-3-(2-piperidin-1-yl-ethoxy)-phenyl]-pyrrolidin-2-one
1-{4-Methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl}-3-(4-methyl-phenyl)-1,5-dihydro-pyrrol-2-one
1-{4-Methoxy-3-[2-(piperidin-1-yl)-ethoxy]-phenyl}-3-(4-methyl-phenyl)-1,5-dihydro-pyrrol-2-one
3-(4-Bromo-phenyl)-1-{4-methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl}-1,5-dihydro-pyrrol-2-one
1-{4-Methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl}-3-(4-trifluoromethyl-phenyl)-1,5-dihydro-pyrrol-2-one
3-(2-Chloro-phenyl)-1-{4-methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl}-1,5-dihydro-pyrrol-2-one
3-(3,4-Dichloro-phenyl)-3-hydroxy-1-{4-methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl}-pyrrolidin-2-one
3-(3,4-Dichloro-phenyl)-3-fluoro-1-{4-methoxy-3-[2-(4-methyl-piperidin-1-yl)-ethoxy]-phenyl}-pyrrolidin-2-one
3-(3,4-Dichloro-phenyl)-1-{4-methoxy-3-[(1-methyl-pyrrolidin-2-yl)-methoxy]-phenyl}-pyrrolidin-2-one
3-(3,4-Dichloro-phenyl)-1-{4-methoxy-3-[(1-methyl-pyrrolidin-2-yl)-methoxy]-phenyl}-3,4-dihydro-pyrrol-2-one

or a pharmaceutically acceptable salt thereof.

12. A process for the preparation of a compound as defined in any of claims 1-11, which process comprises:

(a) reacting a compound of formula (II):



(II)

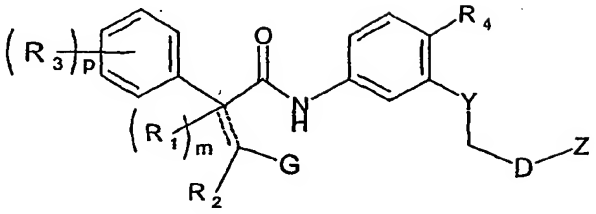
wherein R_1, R_2, R_3, R_4, m, p, X, ======, Y and D are as defined for formula (I), and L is a leaving group, with a compound of formula (III):

Z-H

(III)

wherein Z is as defined for formula (I); or

(b) cyclising a compound of formula (IV):



(IV)

wherein R_1, R_2, m, R_3, p, R4, Y, D, Z and ═══ are as defined for formula (I) and G is a group $-X=CH_2$, wherein X is as defined for formula (I), dehydrogenated as required;

optionally followed by:

- removing any protecting groups; and/or
- converting a compound of formula (I) into another compound of formula (I); and/or
- forming a pharmaceutically acceptable salt.

13. A pharmaceutical composition comprising a compound as defined in any of claims 1-14 and a pharmaceutically acceptable carrier or excipient.

14. A process for preparing a pharmaceutical composition as defined in claim 13, the process comprising mixing a compound a compound as defined in any of claims 1-14 and a pharmaceutically acceptable carrier or excipient.

15. A compound as defined in any of claims 1-11 for use as a therapeutic substance.

16. A compound as defined in any of claims 1-11 for use in the treatment of a CNS disorder.

17. A compound as defined in any of claims 1-11 for use in the treatment of depression or anxiety.

18. A method of treatment of a CNS disorder in a mammal including a human, which comprises administering to the sufferer a therapeutically safe and effective amount of a compound as defined in any of claims 1-11.

19. A method of treatment of depression andor anxiety in a mammal including a human, which comprises administering to the sufferer a therapeutically safe and effective amount of a compound as defined in any of claims 1-11.

20. Use of a compound as defined in any of claims 1-11 in the manufacture of a medicament for use in the treatment of a CNS disorder.

21. The use of a compound as defined in any of claims 1-11 in the manufacture of a medicament for use in the treatment of depression or anxiety.